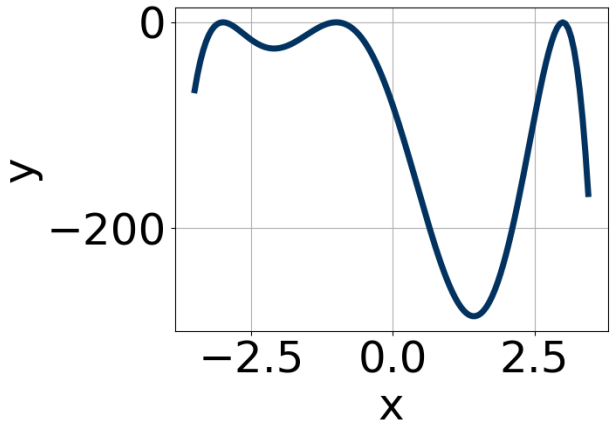
1. Which of the following equations *could* be of the graph presented below?



A. $-18(x+3)^6(x+1)^4(x-3)^8$

B. $12(x+3)^8(x+1)^4(x-3)^7$

C. $-7(x+3)^6(x+1)^{10}(x-3)^7$

D. $8(x+3)^6(x+1)^6(x-3)^6$

E. $-12(x+3)^{10}(x+1)^{11}(x-3)^5$

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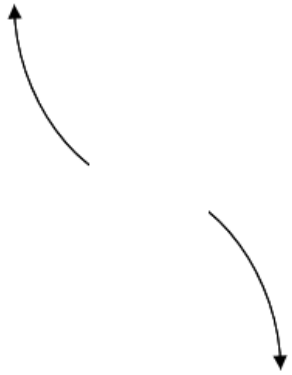
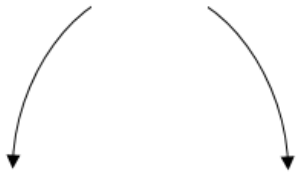
2. Describe the end behavior of the polynomial below.

$$f(x) = -9(x+8)^2(x-8)^5(x-6)^2(x+6)^3$$

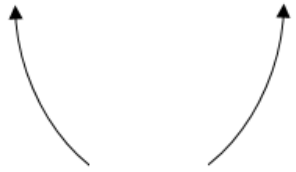
A.

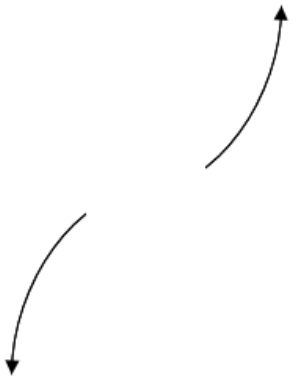


B.



C.



D. 

E. None of the above.

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3. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$4 + 3i \text{ and } 1$$

A. $b \in [1, 2], c \in [-6, -4.35],$ and $d \in [3.48, 4.06]$

B. $b \in [1, 2], c \in [-4.24, -2.63],$ and $d \in [2.96, 3.37]$

C. $b \in [-17, -7], c \in [31.51, 33.82],$ and $d \in [-25.2, -24.86]$

D. $b \in [8, 10], c \in [31.51, 33.82],$ and $d \in [24.44, 25.5]$

E. None of the above.

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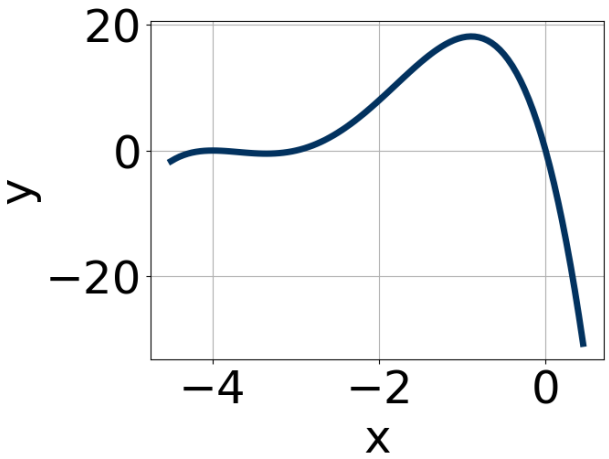
4. Which of the following equations *could* be of the graph presented below?



A. $-5x^5(x+4)^8(x+3)^7$

B. $-19x^6(x+4)^6(x+3)^7$

C. $-14x^{10}(x+4)^9(x+3)^5$

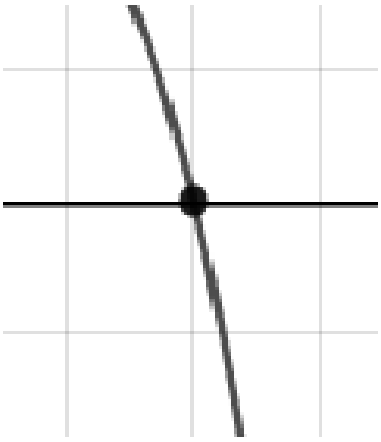
D. $10x^{11}(x+4)^8(x+3)^{10}$

E. $19x^{11}(x+4)^4(x+3)^7$

---

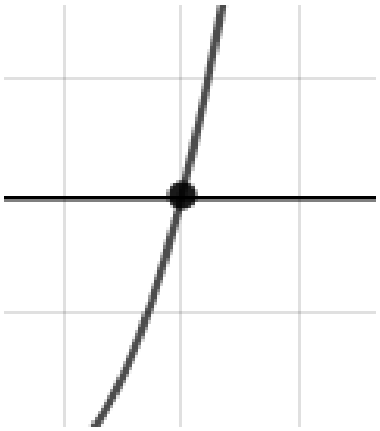
5. Describe the zero behavior of the zero $x = 8$ of the polynomial below.

$$f(x) = -9(x-6)^9(x+6)^6(x-8)^{12}(x+8)^9$$

A. 

B. 

C. 

D. 

E. None of the above.

---

6. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{3}{2}, 5, \text{ and } \frac{-4}{3}$$

A. $a \in [0, 10], b \in [45, 52], c \in [97, 103],$ and $d \in [55, 64]$

B. $a \in [0, 10], b \in [-34, -27], c \in [-9, -4],$ and $d \in [55, 64]$

C. $a \in [0, 10], b \in [-34, -27], c \in [-9, -4],$ and $d \in [-66, -56]$

D. $a \in [0, 10], b \in [26, 37], c \in [-9, -4],$ and $d \in [-66, -56]$

E. $a \in [0, 10], b \in [-13, -7], c \in [-76, -68],$ and $d \in [-66, -56]$

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7. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-3 + 2i \text{ and } 2$$

A. $b \in [-5.5, -1.2], c \in [-3, 3],$ and $d \in [24, 27]$

B. $b \in [0.7, 1.5], c \in [-6, -3],$ and $d \in [0, 9]$

C. $b \in [3.8, 5.3], c \in [-3, 3],$ and $d \in [-32, -24]$

D. $b \in [0.7, 1.5], c \in [-3, 3],$ and $d \in [-10, -3]$

E. None of the above.

---

8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-3}{5}, \frac{-7}{2}, \text{ and } \frac{-3}{2}$$

A. $a \in [15, 23], b \in [110, 119], c \in [165, 169],$ and $d \in [-64, -58]$

B. $a \in [15, 23], b \in [-117, -109], c \in [165, 169],$ and $d \in [-64, -58]$

C. $a \in [15, 23], b \in [110, 119], c \in [165, 169],$ and $d \in [54, 68]$

D. $a \in [15, 23], b \in [-53, -49], c \in [-85, -80],$ and $d \in [54, 68]$

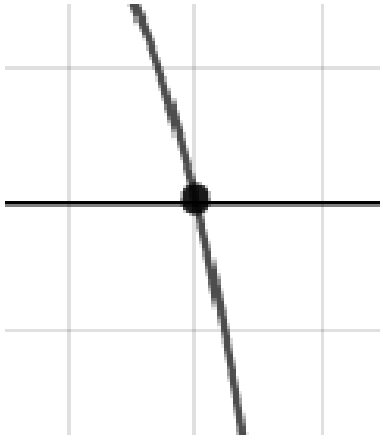
E. $a \in [15, 23], b \in [88, 93], c \in [36, 51],$ and $d \in [-64, -58]$

---

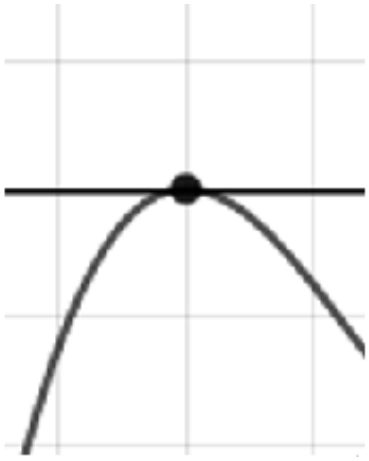
9. Describe the zero behavior of the zero $x = 7$ of the polynomial below.

$$f(x) = 2(x + 7)^7(x - 7)^{10}(x - 3)^4(x + 3)^8$$

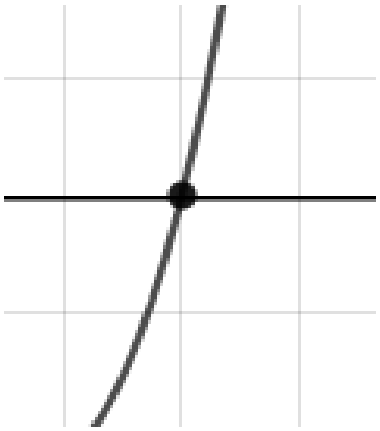
A.



B.



C. 

D. 

E. None of the above.

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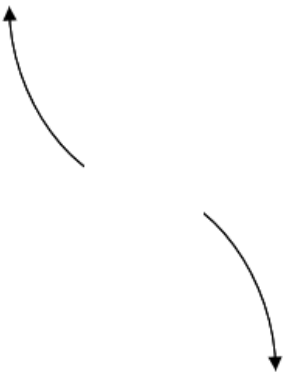
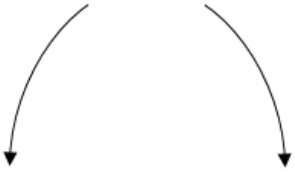
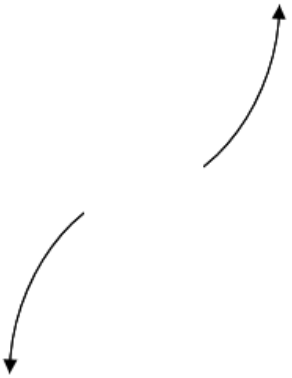
10. Describe the end behavior of the polynomial below.

$$f(x) = -3(x+4)^3(x-4)^6(x-5)^5(x+5)^7$$

A. 

C. 

B. 

D. 

E. None of the above.
